

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application.

1. (Currently Amended) A method of in situ electroremediation of soil material, the method comprising
placing a plurality of electrodes in the soil at respective positions in a land area;
supplying electric current through the electrodes;
obtaining information indicative of electrical resistances of paths from surfaces of respective ones of the electrodes into the soil;
detecting whether increases ~~occurs~~occur in the electrical resistances;
temporarily ~~cutting down~~reducing electrical current at least through a particular electrode in ~~the~~a path from which an increase of ~~the~~ electrical resistance is detected, to a stepped down level, in response to said detection.
2. (Currently Amended) A method according to Claim 1, wherein voltage differences are applied between electrodes from a first group and electrodes from a second group, said ~~monitoring~~obtaining step -comprising measuring overall resistance information indicative of resistances from respective electrodes of the first group to one or more neighboring electrodes from the second group, said overall resistance information being used to detect ~~the~~ resistance increases during the detecting step, the method comprising eliminating at least part of an effect of soil resistivity on said detecting.
3. (Original) A method according to Claim 2, comprising:
placing at least one further electrode in the soil at a distance from said electrodes;
measuring voltage drop information indicative of a voltage drop along a path through the soil starting from said further electrode;
using the voltage drop information to remove at least part of an effect of soil resistivity on the overall resistance information on said detecting.
4. (Currently Amended) A method according to Claim 1, comprising:
placing a plurality of further electrodes in the soil, each at a distance from a respective electrode but closer to said respective electrode than any one of the other electrodes ~~anodes~~of

said further electrodes;

measuring a voltage drop from each of the further electrodes to its respective electrode;

determining the information indicative of electrical resistances from the measured voltage drops.

5. (Currently Amended) A method according to Claim 1, wherein the information indicative of electrical resistances of paths into the soil from surfaces of respective ones of the electrodes is obtained for respective ones or sub-groups of the electrodes individually; the current being ~~cut-down~~reduced only in a particular electrode or group, in response to detection of said increase in resistance in the path from the particular electrode or sub-group.

6. (Currently Amended) A method according to Claim 1, wherein the electrodes include anodes and cathodes placed interspersed with one another in the soil, the method comprising

circulating liquid containing acid and/or another complexing agent around the surface of the cathodes;

obtaining said information indicative of electrical resistances of paths into the soil from surfaces of respective ones of the cathodes;

temporarily ~~cutting-down~~ reducing electrical current at least through a particular cathode in the path from which an increase of the electrical resistance is detected, to a stepped down level, in response to said detection.

7. (Currently Amended) A method according to Claim 6, wherein the current is ~~cut-down~~reduced for a predetermined time interval.

8. (Original) A method according to Claim 7, wherein the predetermined time interval has a duration of between five minutes and two hours.

9. (Currently Amended) A method according to Claim 6, wherein the current to the particular cathode is ~~cut-down~~reduced substantially to zero.

10. (Currently Amended) A method according to Claim 6, wherein the current through a particular anode that is placed closest to the particular cathode is stepped down to

~~cut down~~reduce the current through the particular cathode.

11. (Currently Amended) A method according to Claim 6, wherein the current through individual anodes and/or cathodes is controlled to maintain a regulated average level, independent of soil resistivity, while not ~~cut down~~reduced.

12. (Original) A method according to Claim 11, wherein the set level substantially equals an equilibrium level at which a rate of formation of hydroxyl ions due to the current is in equilibrium with a rate of removal of the hydroxyl ions by acid from the circulating liquid.

13. (Original) A method according to Claim 11, wherein the stepped down level is substantially below the equilibrium level.

14. (Currently Amended) A method of in situ electroremediation of soil material, in a land area where there is a groundwater flow, the method comprising

placing a plurality of first and second electrodes in the soil at respective positions in a land area, the first and second electrodes alternating along a line that extends transverse to a direction of the groundwater flow;

driving electric ~~voltages~~voltage differences between first and second electrodes;

measuring flow speed information about a groundwater flow speed;

lowering and increasing the voltage differences in response to reductions and increases in the measured flow speed respectively, so that the voltage difference remains sufficient to attract substantially all of a contaminant to reach the first or second electrodes.

15. (Original) A method according to Claim 14, comprising
determining a set value for an electric field in the soil for the measured flow speed;
providing at least one sensing electrode in the soil;
measuring a voltage drop from said sensing electrodes;
regulating the voltage differences so that the voltage drop corresponds to the set value of the electric field.

16. (Currently Amended) A method of in situ electroremediation of soil material, in a land area where there is a groundwater flow, the method comprising

placing a plurality of first and second electrodes in the soil at respective positions in a land area, the first and second electrodes alternating along a line that extends transverse to a

direction of the groundwater flow;

placing one or more nutrient infiltration filters along said line;

regulating currents between first and second electrodes;

measuring flow speed information about a groundwater flow speed;

lowering and increasing a level of said current in response to reductions and increases in the measured flow speed respectively, so that the current remains sufficient to spread a predetermined concentration of nutrients into the groundwater flow..

17. (Original) A method according to Claim 16, comprising limiting an electric field between the electrodes to above a level that is selected dependent on the ground water flow speed.

18. (Original) A method of in situ electroremediation of soil material, the method comprising

placing a plurality of electrodes in the soil at respective positions in a land area;

repeatedly sowing and harvesting plants in the land area;

supplying electric current through the electrodes between sowing and harvesting;

repeatedly reversing a polarity of current between the electrodes;

measuring information indicative of cumulative charge passed through respective ones of the electrodes following a reversal of polarity;

selecting a time point when the polarity is reversed dependent on the cumulative charge when the measured cumulative charge reaches a predetermined threshold value.

19. (Currently Amended) A method of in situ electroremediation of soil material, the method comprising

placing a plurality of electrodes in the soil at respective positions in a land area;

supplying electric current through, the electrodes;

regulating a power dissipated in the soil by ~~adjustment~~adjusting of a duty cycle with which current is delivered to the electrodes, the duty cycle comprising periods of at least thirty seconds during which no current is supplied.

20. (Currently Amended) A system for performing in situ electroremediation of soil material, the system comprising

a plurality of electrodes in the soil at respective positions in a land area;
an electric power supply source coupled to supply electric current through the electrodes;

a control circuit arranged to monitor information indicative of electrical resistances of paths into the soil from surfaces of respective ones of the electrodes, to detect increases of the electrical resistances and to temporarily ~~cut-down~~ reduce electrical current from the electric power supply source at least through a particular electrode in the path from which an increase of the electrical resistance is detected, to a stepped down level, in response to detection of said increase.

21. (Original) A system according to Claim 20, wherein opposite poles of the electric power supply source are coupled to a first and second group of electrodes respectively, the system comprising sensors coupled to respective connections between the electric power supply source and respective ones of the electrodes, the sensors being arranged to provide the control circuit with information indicative of respective current-voltage ratio's, each between a current through a respective electrode from the first group and a voltage difference between the respective electrode from the first group and one or more electrodes from the second group, the control circuit deriving the information indicative of electrical resistances for each respective electrode from the respective current-voltage ratio for that respective electrode.

22. (Currently Amended) A system according to Claim 21, wherein the control circuit is arranged to ~~eliminating~~ eliminate at least part of an effect of soil resistivity on the information indicative of respective current-voltage ratio's on the detection of the increases.

23. (Original) A system according to Claim 22, comprising:
at least one further electrode in the soil at a distance from said electrodes, the further electrode coupled to the control circuit;
the control circuit being arranged to obtain voltage drop information indicative of a voltage drop through the soil along a path starting from said further electrode and to use the voltage drop information to eliminate at least part of an effect of soil resistivity on the information indicative of respective current-voltage ratio's on the detection of the increases.

24. (Currently Amended) A system according to Claim 20, comprising

a plurality of further electrodes in the soil, each at a distance from a respective electrode but closer to said respective electrode than any one of the other electrodes ~~anodes of~~ said further electrodes, the further electrode being coupled to the control circuit;

the control circuit being arranged to obtain the information indicative of the electrical resistances from information indicative of voltage drops from the further electrodes to their respective electrodes.

25. (Currently Amended) A system according to Claim 20, wherein the information indicative of electrical resistances of paths into the soil from surfaces of respective ones of the electrodes is monitored for the respective ones of the electrodes individually; the current being ~~cut-down~~reduced selectively through a particular electrode in the path from which an increase of the electrical resistance is individually detected, to a stepped down level, in response to said increase.

26. (Currently Amended) A system according to Claim 20, wherein the electrodes include anodes and cathodes placed interspersed with one another in the soil, the system comprising

a liquid circulation sub-system arranged to circulate liquid containing acid and/or other complexing agents around the surface of the cathodes;

the control circuit monitoring said information indicative of electrical resistances of paths into the soil from surfaces of respective ones of the cathodes, and temporarily ~~cutting down~~ reducing electrical current at least through a particular cathode in the path from which an increase of the electrical resistance is detected, to a stepped down level, in response to said increase.

27. (Currently Amended) A system according to Claim 26, wherein the current is ~~cut-down~~reduced for a predetermined time interval.

28. (Original) A system according to Claim 27, wherein the predetermined time interval has a duration of between five minutes and two hours.

29. (Currently Amended) A system according to Claim 26, wherein the current to the particular cathode is ~~cut-down~~reduced substantially to zero.

30. (Currently Amended) A system according to Claim 26, wherein the current

through a particular anode that is placed closest to the particular cathode is stepped down to ~~cut-down~~reduce the current through the particular cathode.

31. (Currently Amended) A system according to Claim 6, wherein the current through individual anodes and/or cathodes is controlled to maintain a regulated average level, independent of soil resistivity, while not ~~cut-down~~reduced.

32. (Original) A system according to Claim 31, wherein the set level substantially equals an equilibrium level at which a rate of formation of hydroxyl ions due to the current is in equilibrium with a rate of removal of the hydroxyl ions by acid from the circulating liquid.

33. (Original) A system according to Claim 32, wherein the stepped down level is substantially below the equilibrium level.

Claims 34-50 (Canceled).